

REMARKS

I. Status of Claims

Claims 15-34 are pending in this application. No amendments have been made in this Response.

II. Request to Withdraw Finality of Office Action

Applicants respectfully request the Examiner to withdraw the finality of the January 15, 2002, Office Action. The undersigned attorney was informed that the Examiner had agreed to remove finality during a telephonic interview held on April 10, 2002, with a former attorney of record in this case, Pat Shatynski. Since no interview summary formalizing that decision appears to have issued, however, Applicants hereby reiterate their request to withdraw finality.

The January 15, 2002, Office Action presented new grounds for rejection of the claims based on obviousness rather than anticipation. At page 11 of that Office Action, the Office indicates the Amendment dated October 26, 2001, necessitated the new grounds for rejection and, therefore, the January 15, 2002, Office Action was made final. Applicants respectfully disagree that the Amendment necessitated the new grounds for rejection and believe the finality of the January 15, 2002, Office Action is improper.

The Amendment filed October 26, 2001, amended claims 15 and 23 to address the rejections of record at that time. The limitation added by amendment to claim 15 simply incorporated the proviso that the nitrile hydration step be carried out under

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vacuum, and the amendment to claim 23 simply lowered the hydrating step's upper pressure limit from 3.0 bar to 1.0 bar. The requirement of carrying out the first stage of the process under vacuum, or at a pressure no higher than 1.0 bar, was present in the originally filed claims of the present application.

Originally filed claim 7 recited that the first step (hydrating step) is carried out at a pressure ranging between 0.01 and 3 bar. The lower limit of that pressure range, 0.01 bar, is clearly sub-atmospheric, i.e., under vacuum. Claim 23 was added by Amendment on April 5, 2000, to present original claim 7 rewritten in a format that better complied with U.S. patent practice. The addition of new claim 23 did not result in any new grounds for rejection. The October 26, 2001, amendments to claims 15 and 23 merely recite limitations that were encompassed by the original claims and should not have required a new search by the Examiner or new grounds for rejection.

M.P.E.P. § 706.07(a) specifically states that a second or subsequent action on the merits shall not be made final "if it introduces a new ground of rejections not necessitated by amendment." In the present case, the new ground of rejection under 35 U.S.C. § 103 was introduced to address a limitation that was present in claim 7 as originally filed. Because the limitation was previously encompassed in claim 7 and then claim 23, the subsequent amendment to claim 15 incorporating a limitation of original claim 7 could not necessitate a new ground of rejection under 35 U.S.C. § 103(a).

Accordingly, Applicant respectfully submits that the finality of the Office Action dated October 26, 2001, is improper and requests that the finality be withdrawn.

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II. Rejections Under 35 U.S.C. §103(a)

The Office has rejected claims 15-34 under 35 U.S.C. § 103(a) as obvious over Suchsland et al., U.S. Patent No. 5,847,207, ("*Suchsland*") in view of Hsu et al., U.S. Patent No. 5,856,567 ("*Hsu*").

The Office acknowledges that *Suchsland* differs from the instant invention in that the operation of the first step is not carried out under vacuum. (Office Action of January 15, 2002, at 4). However, the Office alleges the combination of *Suchsland* with *Hsu* cures this defect because *Suchsland* teaches the application of vacuum after the formation of the amide and *Hsu* points out that the rate of nitrile hydrolysis can be reduced by the addition of excess water. *Id.* at 5. Based upon this disclosure, the Office alleges that if one of ordinary skill in the art had the desire to increase the rate of nitrile hydrolysis in the first step of the operation, it would have been obvious for the skilled artisan to have operated the first hydrolyzing step of *Suchsland* under vacuum. *Id.* Applicants respectfully traverse this rejection for the reasons of record as well as the reasons presented below.

In evaluating a *prima facie* case of obviousness, 35 U.S.C. § 103(a) expressly requires consideration of the claimed invention "as a whole". *In Re Langer*, 465 F.2d 896, 897, 175 U.S.P.Q. 169, 170 (C.C.P.A. 1972). The Examiner must show some motivation for modifying the teachings of the references, and a reasonable expectation of success in doing so. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the

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desirability of the modification. *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

The presently claimed invention is a process for the hydrolysis of 2-hydroxy-4-methylthiobutyronitrile (HMTBN) comprising, *inter alia*, hydrating HMTBN in a sulphuric acid medium to produce 2-hydroxy-4-methylthiobutyramide, wherein the molar quantity of sulphuric acid relative to the HMTBN is between 0.6 and 0.88 and the hydration is carried out at a temperature of less than or equal to 60 °C and under vacuum.

As motivation to modify the process of *Suchsland* in order to arrive at the claimed invention, the Office points to *Suchsland's* teaching of adiabatic evaporation vacuum cooling of the final amide product coupled with a statement in *Hsu* that indicates the rate of nitrile hydrolysis is reduced by the addition of dilution water. Contrary to the Office's assertions, Applicants respectfully submit that when "viewed as a whole" *Suchsland* in combination with *Hsu* does not teach or suggest operation of the hydration step under vacuum as is presently claimed.

Regarding *Suchsland*, the Office has noted that the optional introduction of a vacuum is done, if at all, after the formation of the final amide product. That is, vacuum is applied after both the hydration of the nitrile and the hydrolysis of the amide are already completed. As acknowledged by the Office, *Suchsland* simply does not teach or suggest performance of the hydration of the nitrile under vacuum.

Hsu discusses that the nitrile hydrolysis rate is reduced by addition of dilution water, and further discloses that a simple adjustment of residence time in the CSTR is all that is required to minimize residual nitrile. (*Hsu*, col. 5, lines 52-65). The Office Action curiously jumps to the conclusion, however, that one skilled in the art would

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recognize that evaporation of excess water vapor would necessarily increase the nitrile hydrolysis rate, even though this is not taught or suggested by *Hsu*. (Office Action, p. 8). Further, the Office concludes that a skilled artisan would be motivated to operate the hydrolysis step under vacuum to accomplish this evaporation, even though neither cited reference teaches or suggests such a modification. *Id.* *Hsu* simply does not teach or suggest that execution of the nitrile hydrolysis can be conducted under vacuum to reduce residual nitrile. Quite the contrary, *Hsu* teaches away from the use of a vacuum, stating that the first step should be conducted at or above atmospheric pressure, 0 to 15 psig (1.01 to 2.02 bar) (*Hsu*, col. 8, line 9).

The skilled artisan would not have been motivated by *Hsu* to modify the process of *Suchsland* by incorporation of cooling under vacuum to reduce excess water and residual nitrile because *Hsu* does not teach use of vacuum or the evaporation of water vapor. Furthermore, *Hsu* clearly discloses that a simple adjustment of residence time in the CSTR is all that is required to minimize residue nitrile.

In *Winner Int'l Royalty Corp. v. Ching-Rong Wang*, the court upheld the district court's finding that there was no motivation to combine references because there was no "apparent disadvantage to the [invention] ... of Johnson." *Winner Int'l*, 202 F.3d 1340, 1349, 53 U.S.P.Q.2d 1580, 1590 (Fed. Cir. 2000), Winner's invention was a self-locking steering wheel anti-theft device using a ratcheting mechanism. The prior art Johnson patent used a dead-bolt which required a key. The prior art Moore patent described a ratcheting mechanism. The issue was whether there was any reason to substitute the more convenient ratcheting mechanism of Moore with the more secure dead-bolt of Johnson.

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Winner argued that Johnson taught away from Moore. The Federal Circuit noted, "Trade-offs often concern what is feasible, not what is, on balance, desirable. Motivation to combine requires the latter." *Id.* Citing *In re Gurley*, 27 F.3d 551, 553, 31 U.S.P.Q.2d 1130, 1131 (Fed. Cir. 1994), the Federal Circuit found that the emphasis in Johnson's specification on security meant there was no motivation to combine it with Moore. The holding of nonobviousness was affirmed because no *prima facie* case of obviousness was established.

In the present situation, *Hsu* emphasized that residual nitrile is significantly reduced simply by ensuring a modest residence time in its nitrile hydrating reactor. No mention of the use of vacuum was made. Just as in *Winner Int'l*, there is nothing in *Hsu* to motivate and direct one of ordinary skill to combine its teachings with those of *Suchsland* because *Hsu* taught a satisfactory, simple to implement, and cost effective solution to the residual nitrile problem and there was no apparent disadvantage to *Hsu*'s disclosed solution.

The Office suggests that one skilled in the art would be motivated to utilize a vacuum in the hydrolysis step because *Suchsland* already suggests applying a vacuum after the formation of the amide. However, *Suchsland*'s optional vacuum evaporation process step is conducted adiabatically, which would not at all be useful in the nitrile hydration step. (*Suchsland*, col. 5, lines 52-53). In adiabatic evaporation, heat does not enter or leave the system being cooled, that is, no external cooling is applied. Cooling is accomplished by using the available sensible heat to supply the latent heat of evaporation so as to transform a liquid into a gas at a given pressure. It is well known in the art that the nitrile hydration process is very exothermic. (*Hsu*, col. 5, line 10). In

fact, to ensure sufficient heat transfer for cooling, *Hsu* recommends conducting the nitrile hydrolysis in a back-mixed, continuously stirred tank reactor. (*Id.*, col. 5, line 11-12). Controlling the nitrile hydration reaction temperature through adiabatic evaporation under vacuum would be extremely difficult because this technique would not be capable of producing the cooling necessary to remove the heat load generated by the highly exothermic reaction, without having a tremendously sized heat sink. As such, one of ordinary skill in the art would not have reasonably expected that implementation of the adiabatic evaporation technique could successfully control the heat load generated during the nitrile hydration. Therefore, there is nothing in *Suchsland* to teach or suggest the desirability of running the nitrile hydration step under vacuum as is presently claimed.

Additionally, when viewed "as a whole", there is simply nothing in the combined teachings of *Suchsland* and *Hsu* to direct or motivate one of ordinary skill in the art to modify the process of *Suchsland* in the manner suggested by the Office. Nothing but the present invention discloses execution of the nitrile hydration step under vacuum. It is impermissible hindsight to use the claimed invention as a guide through the maze of prior art references, combining the right references in the right way to so as to achieve the result of the claim invention. See *Grain Processing Corp. v. American Maize-Products Corp.*, 840 F.2d 902, 5 U.S.P.Q.2d 1788 (Fed. Cir. 1988).

Accordingly, a *prima facie* case of obviousness has not been made. Applicants therefore respectfully request the withdrawal of this 35 U.S.C. § 103(a) rejection.

Applicants respectfully request that this Response After Final be entered by the Office. Applicants point out that the final action by the Examiner presented some new

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arguments as to the application of the art against Applicant's invention. It is respectfully submitted that the entrance of these Remarks would allow the Applicants to reply to the final rejections. Applicants also submit that the entry of the Response would place the application in better form for appeal, should the Office dispute the patentability of the pending claims.

CONCLUSION


In light of the foregoing remarks, Applicants respectfully submit that the pending claims are in condition for allowance. A prompt and favorable action is requested. Please grant any extension of time required to enter this amendment and charge any additional required fees to our deposit account No. 06-916.

Respectfully submitted,

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